

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

7-5-1953
AUG 16 1984
THE HOUSEWIFE'S SHARE IN AGRICULTURAL RESEARCH

Talk by Dr. Byron T. Shroyer, Administrator, Agricultural Research Administration, U. S. Department of Agriculture, before the Newspaper Food Editors' Conference, Chicago, Illinois, on the morning of October 5, 1953.

Most people seem to agree that the American homemaker today is the best informed of any in the world in the matter of food for her family. Food editors have helped to inform her, and are keeping her informed.

Now, as you know, a person engaged in science can't afford to use unverified information. Accordingly, I asked my wife if she reads the food columns in the newspapers. Does she! She handed me a box stuffed with clipped recipes. Then she showed me marked passages about nutrition in other news items that had been saved. I was soon convinced that food editors have much more influence on my meals than I had suspected.

Probably few housewives consider that they have a share in agricultural research. The connection is not always readily visible, especially to one living in a city, well insulated from the farm. I'm sure the housewife who went to market this morning was not concerned about the miracles performed by farmers in the soil; or by food processors in their factory kitchens. Her concern was to get good food -- at a price she could afford to pay -- that would meet the nutritional needs and food tastes of her family.

And right here she began to collect on her share of the dividends that accrue from agricultural research.

I think it is generally agreed the American diet is greatly improved over what it was even a few years ago. Statisticians tell us that per capita food consumption in 1952 was 12 percent higher than during the 1935-39 period.

We certainly have had plenty to eat in recent years. That, of course, doesn't guarantee a diet considered by nutritionists to be adequate. I am not a nutritionist, and shall not presume to speak as one. But I think the figures

do show that we are getting better foods as well as more of them.

Looking at the reports closely, we see that although the average person is eating more pounds of food, he is getting only about the same number of calories as before the war. That's because American people have been shifting away from high-calorie foods and are eating more of the foods important for protein, minerals, and vitamins as well.

For example, in 1952 the average consumption of eggs was 36 percent higher than before the war. Meat consumption was up 18 percent. Milk, cheese, and ice cream were up about 20 percent. The average American also ate 23 percent more citrus fruits and tomatoes, and 11 percent more leafy green and yellow vegetables.

In terms of nutrients, the statistics show the average person is getting less carbohydrates than before the war; a little more ascorbic acid; and significantly more riboflavin, thiamine, niacin, and iron. He consumes 8 percent more protein and 15 percent more calcium, on the average.

One reason for this change in diets is greater knowledge about the value of vitamins, minerals, and proteins. Agricultural research helped to make this possible, starting with the trail-blazing work of Dr. W. O. Atwater in the 1890's. Agricultural research in 1913 ushered in the vitamin era with the discovery by Wisconsin scientists of vitamin A. Research on fatty acids today is opening new vistas. It is remarkable how many of our most significant findings in human health and nutrition have come or are coming from the work of scientists in the Department and at State experiment stations.

The studies underlying our knowledge of nutrition are complex indeed. But what has been learned so far through research has had a definite impact on food selection and food preparation. One sign of this impact is the prominence given to nutritive elements in advertising copy.

Agricultural research not only has produced much knowledge about nutrition. It has made the better diets possible. People learned to eat more meat, milk, eggs, and vegetables; but research first had to help farmers find ways of producing more of these protective foods.

For example, we eat lettuce the year round. That was not always true. Before we could become accustomed to a year-round supply of lettuce, agricultural scientists had to crack some tough problems. For one thing, plant breeders had to develop lettuce varieties which resist wilt and the other diseases that years ago made it difficult to grow lettuce on a commercial scale.

Research also had to find ways of growing lettuce efficiently in the climate and soils of the areas in California and Arizona where most winter crops are grown, and of other areas where summer crops are grown. And research had to find ways of keeping lettuce in good condition while being hauled across the continent to eastern markets. Yes, year-round lettuce definitely is a product of agricultural research.

And the same can be said of just about everything we eat, at any time of the year. There isn't a major crop in the United States that hasn't been improved and modified by science to better meet our needs.

Plant explorers of the Department of Agriculture have brought 200,000 different types of plants from all over the world into this country. Some of these plants have been used by breeders to create new crops, such as the American date industry or the vast soybean industry. Mostly, though, the plant material has been used to make established crops resist a certain disease, or perhaps make them produce more food, or ripen earlier, or fit harvesting machinery.

Or, as in the case of tomatoes, to give them more vitamins.

Few people realize how much trouble fruit and vegetable breeders take to make sure of good eating quality and food value in new varieties they develop. Taste, appearance, and nutritive qualities are among the first of many tests that a prospective variety must pass before it is released for commercial

production. The whole process may take years, but at the end you can be assured the agricultural scientist who says the new variety has superior quality knows what he is talking about.

But new or improved crops are only part of the story. Many improvements also have been made in animal and poultry production.

An outstanding accomplishment is the broiler industry. Fifteen years ago farmers produced only about 1 pound of broiler for each person. But disease control and poultry nutrition research have worked miracles. Today, we produce 12 pounds per person, and fried chicken is no longer a Sunday dinner luxury.

At the same time egg production has been made more efficient. In 1935, hens on the average laid one egg every 3 days; now they lay an egg every 2 days.

When people wanted smaller turkeys with more white meat, our scientists produced the Beltsville White turkey for them.

To give housewives the leaner pork they want, scientists have produced a new meat-type hog which gives more of the choice cuts -- ham, bacon, picnics, and loin -- which people prefer -- and less of the fat which they throw away. So far, of course, production and marketing practices haven't changed sufficiently to put large quantities of the leaner pork on the market; but I feel sure that in time, if housewives show they want it, they will be able to select cuts from meat-type instead of fat-type hogs.

To make more milk available in the South, scientists are developing a new breed of dairy cows, that can stand hot weather better.

Research has boosted beef production. Faster-growing cattle, new ways of getting more meat from a pound of rations fed, improved control of diseases and insects, have made beef production more efficient.

These are only a few of the benefits to housewives from agricultural research. I believe that on these two counts alone -- the greater knowledge of nutrition, and the tailoring of crops and animals to fit modern needs -- this research has been more than justified. But the dividends don't stop there, by any means.

Think what agricultural research has done to help make possible a free and easy shift of population from farms to cities. Millions of workers no longer needed on farms have swollen the ranks of workers in commercial and industrial establishments. There are actually some 2 million fewer workers on farms today than 15 years ago, yet farmers have been able to produce enough not only to take care of our increasing population, but to improve our diets, too.

Machinery and chemicals have played a big part, but don't forget the changes in cultural practices, in handling the soil, in use of fertilizers, in development of better, higher-yielding crop varieties, in controlling diseases, in combatting insect pests, and many other products of research. One development makes another possible or necessary. For example, plant scientists not only developed high-yielding hybrid corn, they also put the ears of corn at an even height from the ground so the corn picking machines could handle them more readily.

Thanks to science, a farmer today can produce a third more crop on one acre of land than he did 15 years ago. It means that one farm worker can produce enough food for himself and 15 others who live in cities. Not so many years ago he could produce only enough for himself and 7 others. And in colonial days, it took the work of 9 men on the land to produce enough for themselves and 1 other person living in the city.

Then there's the matter of marketing. Look back a few years. The store of 50 years ago is almost a museum piece. The farmers' market of even 20 or 25 years ago is a rarity in many parts of the country. Instead, we have supermarkets and other self-service stores. We have groceries in nationally-advertised prepackaged goods instead of bulk. Even the handling of meats and fresh fruits and vegetables has undergone drastic change.

The city traffic problem, which encourages housewives to buy all their supplies at one store, is not the only factor in these changes. Careers for women have multiplied. Household servants have disappeared. These two things alone have generated insistent and increasing demands for food products that can be

prepared quickly and easily for the table with a minimum of work in the home kitchen.

Scientists in industry and Government have responded.

Not only do we have canned goods; we have dry biscuit mix, quick-cooking rice, instant mashed potatoes, partly baked rolls, packaged sliced cheese, frozen orange juice concentrate.

We have frozen meats, fruits, and vegetables. The frozen food industry, almost unknown 20 years ago, today furnishes a substantial portion of the foods we eat. Pre-cooked foods -- from main dishes to desserts -- and even complete, well-balanced meals, are coming to be sold in frozen form.

Agricultural research conducted by the State experiment stations and the Department of Agriculture has a hand in making many of these developments possible. With additional funds made possible by the Agricultural Marketing Act, the Department has been able to put many more marketing problems under scientific scrutiny. Utilization of farm commodities gets similar attention.

I'm sure you know the story of frozen orange juice concentrate. It was developed just after World War II at a time when the citrus industry was in the doldrums. It revitalized the industry, and already the frozen concentrates consume more of the Florida orange crop than is shipped as fresh fruit. But research hasn't stopped there. An improved process recently announced gives the frozen concentrate its fresh-fruit flavor by using the volatile oils. This may lead to a superconcentrated juice -- 6 to 1 instead of the present 4 to 1 -- with added savings to consumers in cost and storage space in refrigerators.

The versatile chemists also have developed an orange powder that dissolves instantly in ice water to make a juice with the color, flavor, and nutritive value of fresh orange juice. One advantage the powder has over the frozen concentrate is that it can be stored on the kitchen shelf with other staples.

The chemists have just developed a grape juice powder, which is undergoing storage tests at present, and are working on tomato juice powder.

There are many other research developments. I'll mention only one or two. Here's one that may interest ex-servicemen of World War II experience. Improved dried eggs are now available. They taste better when cooked, keep much longer than the war-time dried eggs, and have helped to put the new easy-to-use cake mixes containing whole eggs on store shelves.

Following up research which a few years ago made it possible for American Cheddar cheese to be made from pasteurized instead of raw milk, Department scientists have now developed an improved procedure which will cut manufacturing time for Cheddar in half. A public service patent will make the process available to all without charge.

A new flash heating system that can sterilize, concentrate, and cool fluid foods -- all in one short second -- may spell higher quality fruit and vegetable juices, purees, soups, concentrates, and milk products. Its big advantage is that flavor is not destroyed. The process is based on known principles of steam-injection heating that were previously little used in preserving foods. It was developed at one of our laboratories, and several companies already are using the system.

Less kitchen work for homemakers has thrown a bigger burden on farmers, packers, and processors. They do much of the cleaning, trimming, mixing, and cooking that was formerly done in the home. This trend is noticeable in the fresh fruit and vegetable markets as well. Note how many stores sell carrots that are cleaned, topped, and packed in transparent film bags. Or spinach. On almost any produce market shelf these days you can find a soup mix, ready for the pot, or a salad mix, requiring only that the housewife open the package and pour on the salad oil.

Marketing studies by Department technicians have made substantial contributions. Storage, transportation, and packaging costs are showing how to get perishables to the market in better condition, and keep them fresh while in the market.

Now I don't want to give the impression that Government and State research is doing it all, or even most of it, whether it be in farming, in the packing and processing of foods, or in retail stores. Far from it. All of industry, from chemical manufacturers and implement makers to retail grocers, are conducting much research and development. Federal research does not compete with industry. Our men work with industry and commerce as well as with farmers, because it is just as important to agriculture to have farm products marketed properly as it is to grow them properly.

Here's an example of what I mean. I suppose some of you have stood in line with a basketful of groceries, waiting to be checked out of a grocery store. Sometimes the lines get pretty long. Well, a few years ago, our marketing specialists tackled this problem in cooperation with a large food chain. They devised a new check-out counter that helps do the job much faster. A public patent has made these counters available to all. With this stimulus, industry has developed the idea still further. Many new-type check-out counters have been installed, perhaps some in your home community. At the same time, our research workers have been helping to reduce another point of congestion in stores by assisting in the development of self-service meats.

Efficiency in marketing is bound to benefit a housewife.

For example, up to 30 percent of some fruit or vegetable crops may be lost through waste and spoilage. Both the farmer and the housewife lose. A reduction in such losses would mean lower prices to consumers and better prices to farmers.

Working with representative grocers and dealers, our marketing technicians have been teaching retail store clerks and managers how to handle fresh produce more effectively. The latest report shows some 30,000 have received this training.

Of course, a high proportion of the loss or spoilage in a retail store had its start somewhere along the processing line -- perhaps even on the farm during harvest. So research is seeking to cut these losses in shipping, in the operations of packing sheds, and in the harvest operations.

In addition, research chemists have been examining agricultural wastes to see what good uses can be made of them. One of the most flagrant wastes is in the proteins and minerals in milk. The best possible use of milk is as food, but in making butter and cheese a great deal of skim milk, buttermilk, and whey is left over. Most of this is inefficiently used and much is wasted. Some nutrition experts estimate the fat-free part of the milk not being used for human food is sufficient to take care of the requirements of 25 million people a year for calcium and a number of other nutrients.

Our chemists are finding new ways of using more of this part of the milk in food -- for example, as a delicious ice cream made from buttermilk -- and they have also found a number of industrial uses.

Dried milk solids are finding new uses and wider acceptance. Many bakers now use a higher proportion of dried milk solids in bread, with improved nutritional values the net result.

In a report of this nature, it is impossible to give you a complete picture of what is going on. But I do want to tell you a little about what's happening in nutrition research.

Through family food consumption studies we are learning that even though our diets have improved, many people still are likely to fall short of recommended goals in calcium, the vitamins A and C, and some of the B vitamins. But only a relatively few families, chiefly in the lowest income groups, are now seriously short. This is a great improvement since the middle Thirties. Nevertheless, even more milk, more green leafy vegetables, and more of the vitamin C rich vegetables and fruits would help many -- rich and poor alike -- to reach what is believed to be a desirable nutrition level.

The family diet cannot be any better than the food supply that comes into the kitchen, but it may be considerably worse. Here, it seems to me, newspaper food editors serve an important function. They can give information on choosing foods wisely and preparing them properly with the nutritional needs of each family member in mind.

We know, for example, that there are certain vulnerable groups of individuals that should be the targets of nutrition research and information. These include, among others, teen-age children, particularly adolescent girls; homemakers, and both men and women in their later years.

Nutritional experts now recognize that food habits through life may play an important role in delaying or hastening the disabilities of age.

Typical of the survey work is a study recently completed of food eaten in one day by 1,000 homemakers in 4 cities -- Birmingham, Buffalo, Minneapolis-St. Paul, and San Francisco. The research workers feel that although such data may not reveal an individual's food habits, they do give a true picture for the group as a whole.

They found the food intake surprisingly low -- an average of 1,780 calories, well below presently recommended levels. Yet this appeared to be adequate as indicated by weight in relation to age.

A similar low intake of calories by 2,500 women, without evidence of nutritional deficiency, was observed by experiment station cooperators in the North Central Region.

These findings seem to contradict standards which have long been accepted and highlight the need for further research on food energy requirements of women under conditions of present-day living.

If we are to evaluate the meaning of these diet patterns effectively, we need greater knowledge of nutritional requirements. We have quantitative allowances formulated only for calories and a dozen nutrients. We need more exact information about requirements for these and for many additional nutrients.

One study of this nature seeks to determine human needs for unsaturated fatty acids provided by fats and oils in everyday diets. This Department-sponsored study is being made at the University of Texas under contract. It is already known that certain fatty acids have values beyond their contributions to food energy, and are nutritionally essential for normal structure of the skin. One of the more important is linoleic acid.

Preliminary findings from other contract studies seem to show that nuts and oilseeds are among the best sources of linoleic acid. It was found that cooking did not appreciably change the essential fatty acid content of these foods.

Great gaps still remain in our information about the food sources of the approximately 50 different nutrients the body is known to require from its foods. Yet we have made large gains. For example, in 1896, a Department report on food composition gave facts in terms of 5 constituents; in the 1950 edition, 14 constituents for 750 food items were included. Since then, knowledge was advanced so that it now becomes possible to make estimates for the first time of the folic acid content of the national food supply.

Ingenuity in the laboratory often can short-cut old methods and greatly advance our knowledge. For example, a glass stomach devised by laboratory workers in nutrition is helping to uncover more information about proteins. With it, animal digestion now can be largely simulated. Ground food is broken down in a bottle with mild acids, gentle motion, and natural enzymes. The digested material, fed to lactic-acid bacteria, affords a short-cut method for measuring the quantity of any essential amino acid that a food contains.

Being rapid and inexpensive, this method has possibilities for wide use in industry. As it uncovers more information about what happens to foods during cooking, it may in time also change the cookery habits of millions of housewives.

By these examples I don't mean to imply that all problems are solved. Far from it. The 25 different research advisory committees representing farmers, processors, shippers, retailers, consumers, and others, which advise us on our research program, give ample proof that much remains to be done. Their most

difficult problem is one of selection and deciding on priorities of work.

The national Agricultural Research Policy Committee is the over-all guiding group. Paul Willis, my neighbor on this program, is a member. I'm sure he will agree there are many problems about our food supply.

Many of the most difficult problems for the future are linked to our population increase. At the present rate of population increase -- equal to one new person every 12 seconds, or 2,700,000 a year -- the United States will have 190 million people by 1965.

How can we provide enough food for all these people? That may not appear to be a problem when we read about farm surpluses these days, but it isn't a simple matter. I don't mean to imply that we will go hungry. I see no danger of that. What I'm concerned about is how we can provide the quantities of highly nutritious foods we need to maintain, and even perhaps improve, our national diet. Production of the needed meat, milk, vegetables, and fruits that mean better diets requires much money, time, labor, and land, as compared to the more staple cereal and root crops.

Each year's increase in population means that we must increase our food supply by the equivalent of present production on all the farms in Maryland, Delaware, and New Jersey combined. But we don't have enough economically suitable land to increase our food supply merely by bringing new land into cultivation. Then how can we do it? The answer is in more research -- research that will make our land produce even more; that will make farm labor still more efficient; that will preserve what is produced and help us to avoid waste and spoilage in marketing and in the home; that will develop new and better uses of many agricultural commodities.

We have ample proof that ceilings on research knowledge are reflected in ceilings on actual production on farms. If research stops producing new information, yields on farms also level out.

The housewife has a large stake in the progress of agricultural research. In her role as vice president and general manager of the family, she is responsible for keeping that family well fed. It is just as important to her as to farmers to have our scientists do a good job in the years ahead. We have heeded her desires in the past. The lady with the shopping bag who buys America's groceries has influenced our improvement of fruits and vegetables as well as animals. If she likes potatoes with shallow eyes, we develop them for her. If she wants strawberries with a tart flavor, she may have them, too. Improving farm products and finding ways of producing and marketing them more efficiently is our business. We shall continue to meet the needs of the housewife to the best of our ability and resources.

